

Greenspace for Delaware's Future

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Draft for Public Review

Delaware Coastal Zone Management Program

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Greenspace for Delaware's Future

Draft for Public Review

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Summary

One of Delaware's long-standing attractions is its unique and diverse blend of open and natural areas. Expanses of forest land, meadows and wetlands can still be found in surprising abundance in a state located in the center of the densely populated Washington to Boston megalopolis.

The presence of these scenic undeveloped areas, or "greenspaces", can be largely attributed to two factors. Historically, much of Delaware's pristine landscape has been owned and managed by agricultural interests and other associated large landowners. Additionally, a quarter century old land acquisition effort by government and private organizations has led to the permanent protection of habitats important to the survival of native plant and animal species and areas which provide a wide variety of recreational opportunities for Delawareans and visitors to our state.

Today, Delaware continues to enjoy the benefits of a now decade-long period of economic growth and prosperity. With this growth there has come a recognition among the citizenry that, without a conscious effort to preserve key greenspace throughout the state, an important element of the state's "quality of life" will be lost. This conclusion is reinforced in the final report of Delaware's Environmental Legacy Program, in the Quality of Life Initiative of 1987, and in various other reports and programs concerned with the future of Delaware's natural resources.

In response to this concern, the Greenspace for Delaware's Future Committee (Greenspace Committee) was formed in the Spring of 1988 under the auspices of the Governor's Environment and Infrastructure Cabinet Council.

The Greenspace Committee, whose membership included a broad range of environmental managers and resource experts within and outside of state government (see Appendix A for membership), has worked to define a long-range strategy to permanently protect important greenspaces. A key goal of this strategy is to provide recommendations for strengthening and streamlining land acquisition efforts and to provide a variety of additional "protection tools" designed to keep environmentally important lands in private hands in an undeveloped state.

Resources Areas

The centerpiece of the strategy devised by the Greenspace Committee is the designation of nineteen "resource areas" throughout the state. Each resource area is comprised of lands that contain a wide variety of natural and cultural resources significant to our state. A portion of these areas are now under state or federal ownership as parks, wildlife areas or preserves. Collectively, the resources areas comprise approximately 210,000 acres, or 18% of Delaware's total land base and represent the finest examples of Delaware's diverse natural heritage.

Recommendation

It is recommended that the public and private sectors join together in a partnership with the goal of bringing these resources areas under permanent protection by the year 2000. The attainment of this challenging goal will ensure that future generations will enjoy the same important benefits these lands provide to us today.

A brief description of each of the resources areas, and discussion of critical "stand alone" natural and cultural resources are noted below.

Brandywine Creek

This area includes a very diverse Piedmont stream valley, featuring old growth forests, steep slopes, old fields and freshwater wetlands. It contains riparian (streambank) habitat critical to maintenance of water quality and diverse plant communities with rare and endangered species. The proximity of this resource base to urban centers makes it an excellent area for environmental education.

White Clay Creek

This area encompasses a very diverse Piedmont stream valley containing old growth forests, fields, freshwater wetlands and steep slopes. The area contains riparian habitat critical to maintenance of water quality and diverse plant communities with rare and endangered species. The proximity of this resource base to urban centers makes it an excellent area for environmental education.

Christina River

The last remnant of an extensive tidal freshwater marsh and important river corridor in a rapidly developing area is contained within this area. It also represents a significant water quality maintenance area containing highly valuable archaeological sites.

Upper Shoreline—Delaware River

This area includes the last remaining undeveloped Delaware River shoreline above the Chesapeake & Delaware Canal. It contains important historic sites and areas for land and water-based recreation in a highly-developed region. Pea Patch Island, which lies within the boundaries of this area, is a nesting place to over 13,000 wading birds.

Chesapeake & Delaware Canal

This resource area encompasses the two largest freshwater marshes in Delaware and contains regionally unique geologic formations. The wetland areas harbor a rich variety of flora and fauna and provide migratory bird habitat. The upland portions provide a variety of recreation opportunities in a rapidly growing area of New Castle County.

Lower Delaware River Shoreline

Extensive fresh and brackish tidal wetlands providing nesting and feeding areas for many animal species are included in this area. This undeveloped region safeguards water quality and preserves shoreline habitat. The area provides high quality public hunting and excellent wildlife observation opportunities. Numerous archaeological sites are found throughout this resource area.

Bombay Hook

This area includes valuable estuarine wetlands and shoreline habitats harboring significant wildlife populations. The area provides opportunities for public hunting, water-based recreation, wildlife observation and environmental education.

Blackbird

This resource area consists of coastal plain hardwoods protecting headwaters of three undeveloped watersheds and associated prehistoric resources. Blackbird is a forested wetland complex containing significant geological and biological features. This site offers valuable opportunities for environmental education and public hunting.

St. Jones River

This area includes valuable riparian and estuarine wetlands, including opportunities for public hunting in a developing region. Archaeological sites and early colonial settlements are also found in this area.

Central Kent County

This area encompasses extensive upland and bottomland forest. It also offers opportunities for public hunting and outdoor recreation in a developing region and encompasses areas significant for groundwater yield and recharge.

Upper Murderkill River

Scenic river corridors within expansive floodplain forests are found in this area. The dominant landscape is agricultural, with opportunities for water access and an assortment of land-based recreation.

Milford Neck

This area represents the largest extent of privately-owned estuarine shoreline and wetlands in Delaware. It contains critical migratory shorebird feeding and resting areas. The site of a prehistoric Indian burial ground can be found in this area.

Primehook

Acreages of bay front beach, salt marshes, tidal freshwater wetlands, stream corridors and a forested wetland complex containing important geological and biological features in this area provide extensive habitat for very diverse plant and animal communities. The area is also important for public hunting and fishing, and prehistoric resources.



Ellendale/Redden

This area is one of the largest forested wetland complexes in the state and is noted for its groundwater recharge and yield potential. The area contains diverse plant and animal communities and lends itself to environmental education and hunting opportunities.

Cape Henlopen

The cape's sandy peninsula is the dynamic geologic feature represented in this area. The dune landscape, ocean and bay beaches and salt marsh combine to make this a unique natural community.

Inland Bays

Significant acreages of upland forests, fresh and estuarine wetlands, barrier beaches and Delmarva Bays are found in this area. Rare plants and animals along with prehistoric sites are scattered throughout. In this rapidly developing region this area provides outlets for water-based recreation, public hunting, and environmental education.

Great Cypress Swamp

This area contains the largest contiguous forested wetland complex in Delaware. The unique hydrologic and geologic setting of this region promotes a diverse biological community.

James Branch

The complex of ponds and bottomland forested corridors found in this area contains significant archaeological sites. Many rare plants and the northernmost natural stand of bald cypress in North America can also be found here. Significant water-based recreational and environmental education opportunities are available.

Nanticoke River

Dry upland forest, old fields and a tidal river corridor containing valuable freshwater wetlands characterize this area. The area features many rare plants and archaeological sites. Significant sites for public hunting and water-based recreation are also found.

Stand-Alones

Critical natural and cultural resources will be found in areas other than the nineteen broad locations listed above. Through various programs and projects, the State has made commitments to protecting critical resources which "stand alone" from these large areas. Stand-alones are high priority areas for protection. They include state-recognized unique natural areas, habitat for rare and endangered species, cultural resources, mill ponds, freshwater wetlands, and stream valley corridors.

Land Protection Methods

Outright acquisition of lands contained within resource areas by government or private conservation groups is the most traditional, and most dependable method of ensuring lasting protection. However, the availability of financial resources for acquisition may not always be sufficient to prevent unwanted alteration or development of Delaware's outstanding natural and cultural resources. In addition, situations may arise where innovative methods to keep undeveloped areas in private hands may provide benefits not attainable if the property were to come under public sector management.

Recommendation

In light of these facts, the Greenspace Committee recommends that Delaware devise and implement a comprehensive package of land protection methods as part of a greenspace program. Such a package will provide a greater range of options by which public and private interests can secure permanent protection for lands within designated resource areas. Use of alternative land protection methods can also serve as a means to "hold" important greenspace until such time as funding is available for outright acquisition.

The following represents a package of land protection methods to assist Delaware's efforts to ensure long-term greenspace protection.

Conservation Easement—This option allows private landowners to maintain ownership of their lands while at the same time participating in protecting unique and/or historic attributes of their land. Conservation easements require time consuming contacts with individual landowners which, to be effective, will require a partnership between state government and private non-profit agencies.

Purchase of Resource Protection Rights—This protection tool would permit a public or private entity to purchase the rights to manage specific resources or activities such as hunting, mining, development, water, recreation, timber, wildlife, agricultural, visual or scenic vistas, drainage, and cultural or historic resources.

Land Use Regulations: The Overlay Zone—This technique works where there is a single resource requiring a common level of protection such as groundwater recharge and discharge areas, unique natural areas, historic and archaeological sites, steep slopes or floodplains. This type of zoning "overlays" additional protection requirements or standards on the base zoning district whether it is residential, commercial or industrial. In Delaware, all 100 year floodplains are mapped as overlay zones.

Tax Incentives—The first of these categories involves preferential assessments. Other categories include deferred assessments and restrictive agreements. These broad categories of tax incentives represent a starting point from which tax options could be fashioned to encourage the long-term protection of lands important to the state's natural diversity.

State Trust Fund—In 1986 the General Assembly established the Delaware Land and Water Conservation Trust Fund as a stable funding source for the acquisition of open space conservation and outdoor recreation lands. Enough Trust-generated interest had accrued by 1988 to purchase modest amounts of land. A greater commitment to enhance the Fund will be required to achieve the goals set forth in this document.

Local Land Trusts—This type of "grass-roots" effort to preserve a specific piece of property has proven successful in the past in Delaware. Today, there is a need to "network" a series of local and regional organizations which can complement the work of county and state agencies involved in resource preservation.

Estate Planning—Many property sellers are unaware of options such as restrictive covenants or deed restrictions that they could require to preserve important natural or historic attributes associated with their properties. More information should be available to landowners and the development community to explore ways in which quality development can occur or even be enhanced in conjunction with resource protection.

Acquisition Criteria

Preserving greenspace within the nineteen resource areas will require a concentrated effort to maximize the use of available public and private funding. Within the suggested decade-long time frame for achieving the goals of this report, choices on what lands will be purchased among those made available will often be required. The degree to which funding is available may, in some years, make these decisions difficult.

Recommendation

To address this concern, it is recommended that land acquisition by state government be done in a manner that best utilizes the professional judgement of resource management experts and is done in a fashion which is clearly understood, and has high credibility, among potential sellers of land, the Delaware General Assembly, and the public at large.

Recommendation

As part of its work, the Greenspace Committee has revised and expanded the rating system used in past years by the Division of Parks and Recreation to evaluate land parcels made available to the state for purchase.

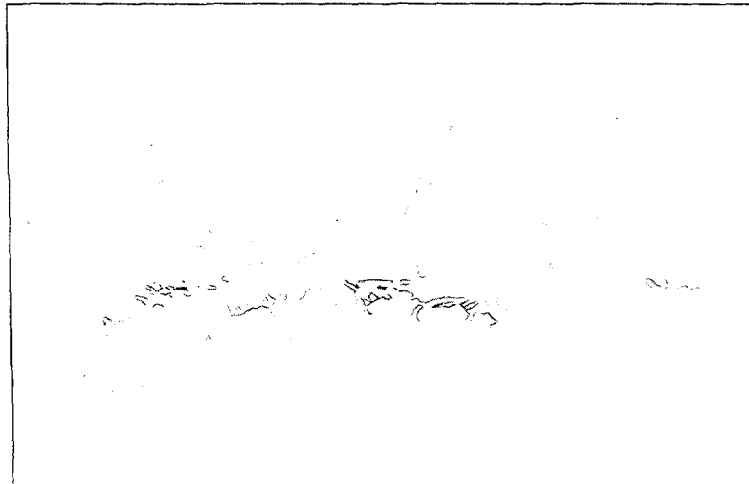
It is recommended that, following extensive public review and comment, the criteria developed for evaluating and ranking land parcels for possible acquisition by state government, as detailed in Section 4 of this report, be recognized as the policy by which greenspace will be purchased by state agencies.

Implementation

Recommendation

Success in achieving the ambitious goals that are set forth in this report will require the combined efforts of local and state government, private conservation organizations, agriculture, business and industry, and concerned citizens throughout the state.

In order to unite these forces, it is recommended that the Department of Natural Resources and Environmental Control take a lead role in forging an alliance between the public and private sectors to carry out the task of permanently protecting the greenspaces identified within the nineteen resource areas. This alliance should work closely with existing organizations, such as the Commission on Open Space and Natural Areas, and a recommended permanent working committee of technical experts from within and outside of state government.





Introduction and Background

The practice of setting aside lands for community use and conservation is a concept which predates the establishment of our nation. Early settlers and Colonial leaders recognized the importance of designating open spaces in cities and rural areas for recreation, hunting, grazing and commerce. Perhaps, the best-known examples here in Delaware are the Dover Green, New Castle Green and the Warner Grant near Lewes. In the 1800's, the grant parks of our large cities were set aside and developed for recreation and the country's first forest preserves and national parks were established. The early part of this century saw the creation of our extensive state and municipal park systems. In recent years, the focus has been on protecting critical natural areas and providing close-to-home recreation for ever-growing suburban populations.

The need to acquire and protect land for resource conservation and public recreation use has been well documented. It is generally accepted that open spaces are vital to our physical and emotional well-being and to the biological health of our planet. In Delaware, lands have been acquired for recreation and open space for well over 100 years. Each generation has had different priorities, laying the groundwork for the extensive network of recreation and conservation lands which we now treasure. But, the present generation, like those which preceded us, recognizes that land conservation is a never-ending task. This responsibility becomes even more critical as population and development increase and fewer and fewer quality open spaces remain to be preserved for any purpose.

Categories of Need

The extent of the need for additional public lands for recreation and conservation can best be understood by considering the diverse types of land for which existing public policy promotes acquisition:

State Parks—Delaware's state park system includes twelve parks and four preserves comprising over 11,000 acres. Inland and ocean front parks provide for a broad range of outdoor recreation opportunities for residents and visitors. None of these parks has achieved the final boundaries proposed in the various master plans. Inholdings and extensions must be acquired in order to provide a base for facility development, to protect natural resources and to promote efficient management.

Fish and Wildlife Areas—Over 33,000 acres are managed by DNREC for fish and wildlife purposes including hunting and wildlife areas, fishing and boating access points and many inland freshwater ponds. As opportunities for hunting and fishing on private land are diminished by competing land uses, these areas become increasingly important. Inholdings, extensions and new areas must be acquired, especially on ponds, streams and along the Delaware Bay and Inland Bays.

Museums and Historic Sites—Delaware's 24 state museums and historic sites encompass, preserve and interpret significant aspects of the state's history and prehistory. In many cases, the setting of the museums is threatened by incompatible development. It is important to acquire or protect by other means extensions of several museums properties to expand the interpretation and accurately convey the historic setting.

State Forests—The large majority of forested lands in Delaware are privately owned. Our two state forests contain 6,700 acres and are managed for multiple uses including timber production, outdoor recreation and open space protection. Many of the forest parcels are not connected. Purchase of inholdings and connector parcels could make these areas more effective in managing their multiple uses.

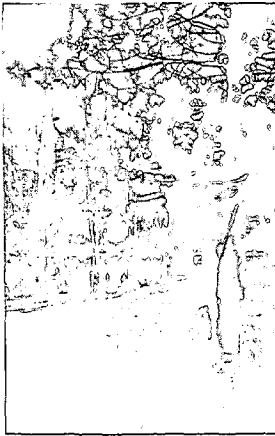
Natural Areas—A statewide Natural Areas Preservation System was established by the Legislature in 1978 to protect outstanding natural lands in three categories: ecological, geological and archaeological. Seventy-four areas are now on the inventory and comprise thousands of acres in public and private ownership. Eight areas have already been permanently dedicated as nature preserves through a combination of public and private action. However, outright acquisition is the only solution to permanently preserve a large portion of these properties.

County/Regional Parks—New Castle County maintains an extensive network of county and neighborhood parks, mostly above the Canal. Kent County operates only one regional park and Sussex County owns no parkland. Trends indicate that the public desires close-to-home recreation opportunities. Growing populations around the C & D Canal, and areas in Kent and Sussex Counties will require close-to-home open spaces for recreational opportunities.

Municipalities/Urban Areas—Wilmington and most small cities and towns provide parks and open spaces of varying functions and sizes. Nearly all of these communities are growing; demand for appropriate recreation areas and open spaces will follow. Though lands needed in these areas may be small, their cost may be proportionately higher than rural open space.

Private and Specialized Areas—Many private, non-profit organizations have land conservation as a primary or secondary purpose. Organizations such as Delaware Wild Lands (DWL), the Delaware Nature Society (DNS), and The Nature Conservancy (TNC) purchase or advocate the purchase of particular types of land. These groups have special interests in sites that include coastal areas, wetlands, rare plant sites, stream valleys, nature centers and outdoor education areas.

Greenways—As efforts to preserve open space for recreation and conservation become more sophisticated, the relationship of all of the above-mentioned resources becomes more apparent. Utilizing the greenway concept, these areas can be interconnected to the benefit of wildlife and recreationists and to enhance and buffer existing conservation lands. Such a greenway effort will necessitate the acquisition of some lands which would not otherwise fit into the above groupings. This approach is also a recommendation of the Delaware Environmental Legacy Program.



Lands of State Significance

Although many areas throughout the state are valued for their ecologic or recreational value, it is clear that certain lands within our boundaries comprise important elements of Delaware's natural and cultural heritage. Some of these areas, such as Cape Henlopen or Cypress Swamp, are well known to most Delawareans. However other sites, which may contain any number of important plant or animal species or cultural resource, are less well known but are equally significant.

The centerpiece of the program outlined by Greenspace for Delaware's Future Committee are lands which are highly important to the state's natural and cultural heritage and biological diversity. These lands are identified in the following sections and should be targeted for long-term protection. Such lands, either by themselves or in conjunction with other properties, comprise an inventory of lands which are of statewide significance to the citizens of Delaware.

Through an extensive examination of Delaware's natural and cultural landscape by natural and cultural resource experts from a cross section of state agencies, 19 broad geographic areas have been identified. These lands of state significance have met one or more of the following criteria listed below:

1. Lands which contain multiple outstanding resources of statewide importance and which values can be supported by information from a data base, comprehensive published report, or local, state or federal resource management plan; and/or
2. Lands which contain a single exceptional ecologic, botanic, geographic, historic or geologic attribute that is recognized as having state, national or international importance; and/or
3. Lands which provide public access to outdoor recreational opportunities and which have been recognized as such by information from a data base, comprehensive published report(s), or through the resource management plans of local, state or federal agencies.

The nineteen locations, referred to as "resource areas," are presented in the following sections including descriptions of their attributes, site activities, acreages protected and unprotected and existing management responsibilities.

Resource Areas

Brandywine Creek

Overview	Very diverse Piedmont stream valley, featuring old growth forests, steep slopes, old fields and freshwater wetlands. This resource area contains riparian habitat critical to maintenance of water quality and diverse plant communities with rare and endangered species. The proximity of this resource base to urban centers makes this an excellent area for environmental education.
Attributes	<p>5.8 miles along a steep, rocky sloped major stream valley with valuable geologic and unique natural community features</p> <p>Protected resource area helps maintain high water quality</p> <p>Significant historical and archaeological features</p> <ul style="list-style-type: none"><input type="checkbox"/> Prehistoric sites representing small camps and villages from 3000 B.C. to 1650 A.D.<input type="checkbox"/> Nationally significant historic mill sites and related structures <p>Contains 3 State-recognized natural areas</p> <p>Two sites, Tulip Tree Woods and Fresh Water Marsh dedicated as Nature Preserves—36 acres combined</p> <p>Very diverse plant community with known location for 23 rare plant species of State concern</p> <p>Diverse animal community with known location for 5 animal species of State concern</p> <p>Uplands include mix of old growth forests; 300+ acres forested</p> <p>Wide array of land-based recreation opportunities</p> <p>Access to water-based recreation opportunities</p> <p>Environmental education and interpretive opportunities are very extensive</p>
Current Acreage	<p>This resource area features one management unit, Brandywine Creek State Park, 783 acres. It is located along the upper portion of the Brandywine Creek currently protecting 1.6 miles of riparian habitat.</p> <p>This area is buffered by lands under conservation easements with the Brandywine Conservancy and lands held by the Woodlawn Trustees in both Delaware and Pennsylvania.</p>
Proposed for Protection	<p>Approximately 800 acres along the river between the park and the state line are a recommended addition to this resource area</p> <ul style="list-style-type: none"><input type="checkbox"/> Protection of these lands will protect more of the natural resources listed above as well as another 4.2 miles of stream corridor

White Clay Creek

Overview

Very diverse Piedmont stream valley containing old growth forests, steep slopes, old fields and freshwater wetlands. This resource area contains riparian habitat critical to maintenance of water quality and diverse plant communities with rare and endangered species. The proximity of this resource area to urban centers makes this an excellent area for environmental education.

Attributes

7.3 miles of undeveloped riparian habitat helps maintain high-water quality
□ 4.2 miles along the White Clay Creek and 3.1 miles along Middle Run

Significant historic and archaeological features

- Prehistoric hunting camp locations, from 9000 B.C. to 1650 A.D. and historic settlement perhaps dating to as early as the 17th century

Significant geologic features including steep slopes

Contains 3 State-recognized natural areas

Very diverse plant community with known location for 24 rare plant species of State concern

Diverse animal community with known location for 2 rare animal species of State concern

700 acres of forest lands

Wide array of land-based recreation opportunities

Access to water-based recreation opportunities

Significant hunting opportunities

Environmental education and interpretive opportunities are very extensive

Current Acreage

Several management units make up this resource area protecting 1,910 acres and 5.1 miles of riparian corridor. The 593-acre Walter S. Carpenter Jr. State Park joins the 569-acre White Clay Creek Preserve—Delaware's portion of the Bi-State Preserve. (Pennsylvania manages 1,252 acres). Both units are managed by the State Division of Parks & Recreation.

The Middle Run Natural Area is a part of this resource area. It contains 748 acres and is managed by the New Castle County Department of Parks & Recreation.

The City of Newark has several holdings along the White Clay Creek of about 20 acres.

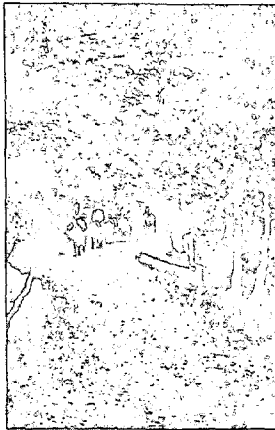
Proposed for Protection

As part of an acquisition package presented June 1988, 321 acres are to be purchased that will nearly connect the White Clay Preserve with the Middle Run Natural Area.

University of Delaware properties total approximately 302 acres adjoining the Middle Run Area.

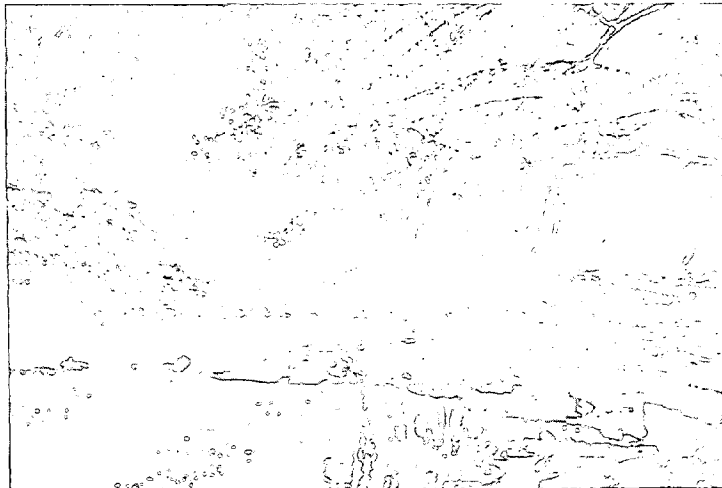
Lands leased by the State adjoining Carpenter State Park and properties paralleling White Clay Creek are proposed park additions.

This resource area with the proposed 2,600 acre additions will become the most extensive greenway corridor in New Castle County and will protect an additional 2.2 miles of riparian corridor.



Christina River

Overview	Last remnant of an extensive tidal freshwater marsh and important river corridor in a rapidly developing area. Significant water quality maintenance area containing highly valuable archaeological sites.
Attributes	<p>19.4 miles of tidal freshwater riparian habitat helps maintain high water quality.</p> <p>Very significant historical and archaeological features</p> <ul style="list-style-type: none">□ Prehistoric archaeological sites of statewide significance representing hunting camps from 8000 B.C. to large living sites from 3000 B.C. to 1600 A.D. Early historic living sites from the 17th and early 18th century <p>Contains 2 State-recognized natural areas</p> <p>Diverse plant communities with known location for 5 rare plant species of State concern</p> <p>Diverse animal communities</p> <p>600 acres of floodplain and upland buffer forests</p> <p>Access to water recreation opportunities</p> <ul style="list-style-type: none">□ Two boat ramps
Current Acreage	Lewden Greene Park and Becks Pond Park total 246 acres managed by the New Castle County Department of Parks & Recreation.
Proposed for Protection	Protection of this unprotected resource area (approximately 3,000 acres) is essential for water quality maintenance in upper New Castle County. Currently 18.6 miles of river corridor are unprotected.



Upper Delaware River Shoreline

Overview	Last remaining undeveloped Delaware River shoreline above the Chesapeake & Delaware Canal. Contains high quality historic sites and areas for land and water-based recreation in a highly-developed region. Pea Patch Island is a nesting area to over 13,000 wading birds.
Attributes	<p>5.5 miles of tidal freshwater shoreline protecting 5 disjunct properties</p> <p>Very significant historic features</p> <ul style="list-style-type: none">□ Prehistoric sites representing small camps and villages and historic archaeological sites representing early colonial occupation□ Nationally significant Fort Delaware State Park in this area <p>Contains 2 State-recognized natural areas</p> <ul style="list-style-type: none">□ Dedicated, Pea Patch Island Nature Preserve—155 acres <p>Four rare plant species of State and one of Federal concern (bur-marigold)</p> <p>Diverse animal community</p> <p>100 acres of mixed forest cover at Bellevue State Park</p> <p>Very wide array of land-based recreation opportunities</p> <p>Good access to water-based recreation opportunities</p> <p>Environmental education and interpretative opportunities are extensive</p> <p>Significant water recharge area</p>
Current Acreage	This resource area follows the Delaware River from the state line south to the city limits of Delaware City. 971 acres are protected within several resource units: Bellevue State Park, 271 acres; Fox Point Park, 170 acres; Battery Park, 20 acres; Ommelanden Training Center, 223 acres; and Fort Delaware State Park on 288 acre Pea Patch Island. These parcels protect 4.75 miles of shoreline. The shoreline fringes of the 234 acre National Guard site adjoining Ommelanden can also be included in this resource area.
Proposed for Protection	<p>Bellevue State Park and Fox Point Park are separated by 53 undeveloped acres in two adjoining parcels. The addition of this area will produce a valuable greenway corridor in a highly developed urban area.</p> <p>An additional 0.75 miles riparian habitat and freshwater wetlands, containing approximately 300 acres along the river shoreline, should be protected to provide the public with greater access to the shoreline for either active or passive recreation.</p>

Chesapeake & Delaware Canal

Overview

This resource area encompasses the two largest freshwater marshes in Delaware and contains regionally unique geologic formations. The wetland areas harbor a rich variety of flora and fauna and provide migratory bird habitat. The upland portions provide a variety of recreation opportunities in a rapidly growing area of New Castle County.

Attributes

5 miles of Delaware River shoreline, 11.8 miles of canal shoreline and 3.5 miles of riparian shoreline are in this area.

- 1,760 freshwater wetland acres at Dragon Run and Thousand Acre Marsh

Very significant geologic features

Contains 3 State-recognized natural areas

Significant water recharge area

Very significant historical and archaeological sites

- Undisturbed areas have a high probability for prehistoric hunting and gathering camps and early historic archaeological sites at the east end of the canal
- Two historic districts, Delaware City and St. Georges, are adjacent to the area as well as a number of 19th century farm complexes

Diverse plant community with known location for 6 rare plant species of State concern

Very diverse animal community

Approximately 1500 acres of forested lands

Very wide array of land-based recreational opportunities

Good access to water-based recreational opportunities (Lums Pond C & D Canal and Delaware Bay)

Very significant hunting opportunities

Environmental education and interpretive opportunities are extensive

Current Acreage

This resource area encompasses several management units. Lums Pond State Park (1,757) is managed by the Division of Parks & Recreation. The Division of Fish & Wildlife owns 679 and leases 5,178 acres from the U.S. Army Corps of Engineers. The Division of Fish and Wildlife also manages the 1,410-acre Augustine Wildlife Area, 96-acre Augustine Beach Access and 50-acre Reedy Island in the Delaware River.

The Governor Bacon Health Center located along the Delaware River and north of the Canal contains approximately 110 acres that may be managed as an adjunct of Fort Delaware State Park.

Proposed for Protection

Areas recommended for protection in this resource area (totaling approximately 3,600 acres) include the Dragon Run Marsh, north of the canal and Thousand Acre Marsh on the south side adjoining Augustine Wildlife Area.

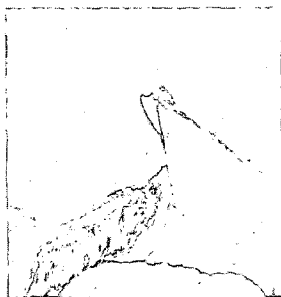
The protection of additional lands will help maintain the largest freshwater wetlands complex in northern Delaware, including 3.5 miles of riparian habitat.

Lower Delaware River Shoreline

Overview	Extensive fresh and brackish tidal wetlands providing nesting and feeding areas for many animal species. This undeveloped area safeguards water quality and preserves shoreline habitat. The area provides high quality public hunting and excellent wildlife observation opportunities. Numerous archaeological sites are found throughout the resource area.
Attributes	<ul style="list-style-type: none"><input type="checkbox"/> 62.4 miles of undisturbed riparian habitat and approximately 9.75 miles of continuous Delaware River shoreline helps maintain high water quality<input type="checkbox"/> 5 coastal river systems and the Delaware River<input type="checkbox"/> Critical habitat for wood duck and black duck<input type="checkbox"/> Productive fish nursery <p>Very significant historical and archaeological features</p> <ul style="list-style-type: none"><input type="checkbox"/> Major prehistoric encampments beginning by 3000 B.C. as well as English settlement in the early 18th century <p>Contains 7 State-recognized natural areas</p> <ul style="list-style-type: none"><input type="checkbox"/> Armstrong Heronry Nature Preserve—88 acres <p>Known location for several rare plant species of State concern</p> <p>Very diverse animal community</p> <ul style="list-style-type: none"><input type="checkbox"/> Buffer and feeding area for wading birds and migratory shorebirds<input type="checkbox"/> One of largest great blue heron nesting sites on the east coast <p>1,100 acres of forest land</p> <p>Access to water-based recreational opportunities</p> <p>Very significant hunting opportunities</p>
Current Acreage	This resource area contains 4,021 acres managed by the Division of Fish & Wildlife in the Silver Run, Appoquinimink and Cedar Swamp Wildlife Areas. Delaware Wild Lands, a private conservation group, owns 3,636 acres.
Proposed for Protection	<p>7.0 miles of shoreline and 12.7 miles of riparian corridor are protected.</p> <p>Approximately 19,000 acres along six coastal river systems and the Delaware River are recommended for protection, including 2.8 miles of shoreline and about 50 miles of riparian habitat.</p>

Bombay Hook

Overview	Valuable estuarine wetlands and shoreline habitats harboring significant wildlife populations. Area provides opportunities for public hunting, water-based recreation, wildlife observation and environmental education.
Attributes	<p>Over 25,000 acres of undisturbed wetlands consisting of 20.2 miles of continuous Delaware Bay shoreline and 88.3 miles of riparian habitat help maintain high water quality.</p> <ul style="list-style-type: none">□ Six coastal river systems and the Delaware River <p>Significant historical and archaeological features</p> <ul style="list-style-type: none">□ Scattered hunting and gathering sites interspersed with a few small village sites from 3000 B.C. to 1650 A.D. Early English settlements from the 18th century are likely. <p>Contains 2 State-recognized natural areas</p> <p>Very diverse animal community with known location for several rare animal species of State and Federal concern</p> <ul style="list-style-type: none">□ Crucial feeding and resting area for migratory shorebirds□ Wintering habitat for geese and ducks in the Atlantic Flyway□ Bald eagle nesting and feeding area <p>505 acres of coastal forest</p> <p>Good access to water-based recreational opportunities</p> <ul style="list-style-type: none">□ 4 boat ramps <p>Very significant hunting opportunities</p> <p>Environmental education and interpretative opportunities are very extensive</p>
Current Acreage	This resource area includes 15,333 acres in the Bombay Hook National Wildlife Refuge. The state-managed Little Creek Wildlife Area protects 4,679 acres and 4,318 acres of the Woodland Beach Wildlife Area. These sites currently protect 14.8 miles of shoreline and 54.4 miles of riparian corridor.
Proposed for Protection	An addition of approximately 12,500 acres is recommended in order to protect an additional 5.4 miles of shoreline and about 40 miles of riparian habitat.



Blackbird

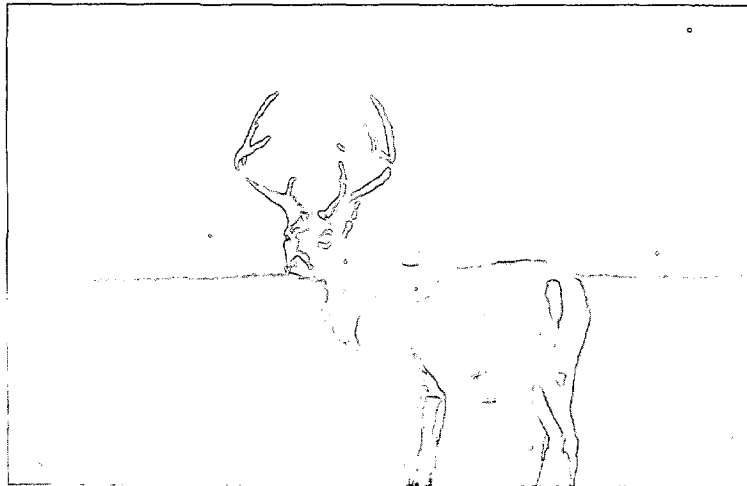
Overview	<p>This resource area consists of coastal plain hardwoods protecting headwaters of three undeveloped watersheds and associated prehistoric resources. Blackbird is a forested wetland complex containing significant geological and biological features. This site offers valuable opportunities for environmental education and public hunting.</p>
Attributes	<p>This resource area is significant for water recharge and maintenance of water quality.</p> <ul style="list-style-type: none">□ 9.7 miles of stream corridor <p>Scattered coastal plain ponds known as Delmarva Bays which are geologically and biologically unique</p> <p>Very significant historical and archaeological features</p> <ul style="list-style-type: none">□ Large hunting and living sites before 3000 B.C. with smaller prehistoric sites thereafter. Scattered 18th century farmstead sites likely. <p>Contains 2 State-recognized natural areas</p> <ul style="list-style-type: none">□ Blackbird Delmarva Bays Nature Preserve—20 acres <p>Very diverse plant community with known locations for 4 rare plant species of State concern including 3 of Federal concern (small whorled pogonia, Barratt's sedge, Harper's fimbriatilis)</p> <p>Very diverse animal community with known locations for 3 rare animal species of State concern</p> <p>2,518 acres of mixed hardwood and pine woodlands</p> <p>Wide array of land-based recreational opportunities</p> <p>Very significant hunting opportunities</p> <p>Environmental education and interpretative opportunities are very extensive</p>
Current Acreage	<p>Two management units make up this resource area. Blackbird State Forest is composed of five tracts totaling 1,719 acres and Blackiston Wildlife Area is composed of four tracts totaling 1,581 acres, protecting 1.9 miles of riparian habitat.</p>
Proposed for Protection	<p>Recommended additions to this resource area would protect approximately 13,000 acres including a unique freshwater wetland complex and 7.2 miles of riparian headwater corridors.</p> <p>This resource area flows into the Millington Wildlife Area in Maryland.</p>

St. Jones River

Overview	Valuable riparian and estuarine wetlands, including opportunities for public hunting in a developing region. This area contains archaeological sites and early colonial settlements.
Attributes	<p>18.2 miles of riparian shoreline and 1.8 miles of Delaware Bay shoreline and adjoining wetlands help maintain high water quality.</p> <p>Very significant historical and archaeological features</p> <ul style="list-style-type: none"><input type="checkbox"/> Prehistoric archaeological sites of statewide significance including small base camps, hunting and gathering sites from 7000 B.C. to 1650 A.D.<input type="checkbox"/> Early historic archaeological sites representing first English settlement in Kent County in the late 17th century and many 18th century sites.<input type="checkbox"/> Nationally significant historic properties including the John Dickinson Plantation and Kingston-Upon-Hull. <p>Diverse plant and animal communities</p> <ul style="list-style-type: none"><input type="checkbox"/> Bald eagle feeding area <p>210 acres of woodlands</p> <p>Access to water-based recreational opportunities</p> <p>Very significant hunting opportunities</p> <p>Environmental education and interpretative opportunities are very extensive</p>
Current Acreage	This resource area is composed of four management units. The 18 acre Dickinson Plantation is managed by the Division of Historic and Cultural Affairs. The Division of Fish and Wildlife manages 2,019 acres at the Ted Harvey Conservation Area, 181 acres at the Buckaloo Tract, 176 acres at the Roberts Tract and 30 acres in a series of river islands. Kent County Department of Parks and Recreation manages 18.5 acres at Tidbury Creek Park. The shoreline and 4.2 miles of riparian habitat are protected in this resource area.
Proposed for Protection	An addition of approximately 4,000 acres is recommended to protect natural and nationally significant historic features in Kent County and an additional 14.0 miles of riparian corridor.

Central Kent County

Overview	Extensive areas of upland and bottomland forest offering opportunities for public hunting and outdoor recreation in a developing region and encompassing areas significant for groundwater yield and recharge.
Attributes	<p>2,934 acres forest cover</p> <ul style="list-style-type: none"><input type="checkbox"/> Mixed hardwoods<input type="checkbox"/> Pockets of loblolly and Virginia pine <p>Contains 1 State-recognized natural area</p> <p>Diverse plant and animal communities</p> <p>Wide array of land-based recreational opportunities</p> <ul style="list-style-type: none"><input type="checkbox"/> Wildlife observation<input type="checkbox"/> Hiking, horseback riding <p>Very significant hunting opportunities</p> <p>Water recharge/yield</p>
Current Acreage	This site contains the 3,539 acre Norman G. Wilder Wildlife Area managed by the Division of Fish & Wildlife.
Proposed for Protection	An addition of approximately 5,600 acres is recommended to connect the two tracts of the Wilder Area and provide the largest contiguous recreation and conservation spot in central Kent County.



Upper Murderkill River

Overview	Scenic river corridors within expansive floodplain forests. The dominant landscape is agricultural, with opportunities for water access and an assortment of land-based recreation.
Attributes	<p>17.6 miles of riparian habitat helps maintain high water quality</p> <ul style="list-style-type: none">□ Contains main stem Murderkill River (9.4 miles), Spring Creek (5.4 miles), and Browns Branch (2.8 miles) <p>Significant historical and archaeological features</p> <ul style="list-style-type: none">□ Prehistoric sites representing large base camps or villages from 2000 B.C. to 1650 A.D. and historic sites of early milling activities <p>Contains 1 State-recognized natural area</p> <ul style="list-style-type: none">□ 140 acres dedicated in the Murderkill River Nature Preserve in 4 tracts <p>Diverse plant community with known location for 4 rare plant species of State concern</p> <p>Diverse animal community</p> <p>850 acres of forest cover</p> <p>Very wide array of land-based recreational opportunities</p> <p>Good access to water-based recreational opportunities</p> <ul style="list-style-type: none">□ 6 boat ramps <p>Environmental education and interpretative opportunities are extensive</p> <p>Significant water recharge area</p>
Current Acreage	The Division of Parks & Recreation manages 782 acres including Killens Pond State Park with 642 acres. The park surrounds Killens Pond and borders Coursey Pond protecting 4.2 miles of river corridor. The Division of Fish & Wildlife manages Coursey Pond and access area, 63.75 acres.
Proposed for Protection	<p>Approximately 2,370 acres of additions to this resource area are proposed as follows:</p> <p>370 acres at Killens Pond State Park</p> <p>Approximately 2,000 acres along the Murderkill River, Browns Branch, and Spring Creek with about 13 miles of river corridor.</p>

Milford Neck

Overview

Largest extent of privately-owned estuarine shoreline and wetlands in Delaware, containing critical migratory shorebird feeding and resting area. Site of prehistoric Indian burial ground.

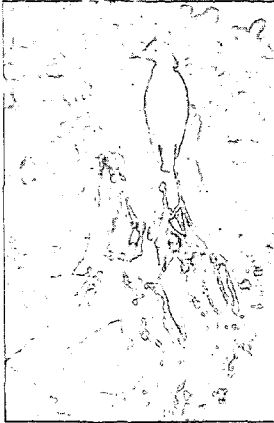
Attributes

23.6 miles of riparian shoreline and 10.2 miles of Delaware Bay shoreline help maintain high water quality

- Largest continuous length of unprotected shoreline in Delaware

Very significant historical and archaeological features

- Scattered prehistoric hunting and gathering sites from 6500 B.C. to 1650 A.D. with increasing number of small village sites after 1000 B.C. Eighteenth century colonial English settlement sites expected.
- Historic structures in the area represent scattered late 18th and 19th century farmsteads.



Contains 2 State-recognized natural areas

Diverse plant community

Very diverse animal community with known location of rare animal species of State and Federal concern

- Bald eagle nesting and feeding area
- Critical link in the Western Hemisphere Shorebird Reserve Network

Wide array of land-based recreation opportunities

Good access to water-based recreation

- Bowers Beach and Cedar Creek boat ramps

Very significant hunting opportunities

Environmental education and interpretative opportunities are extensive

Current Acreage

Sites protected within this resource area include 2,838 acres managed by the Division of Fish and Wildlife and 1,796 acres owned by Delaware Wild Lands, a private conservation group. These sites protect 2.2 miles of shoreline and 2.9 miles of riparian corridor.

Proposed for Protection

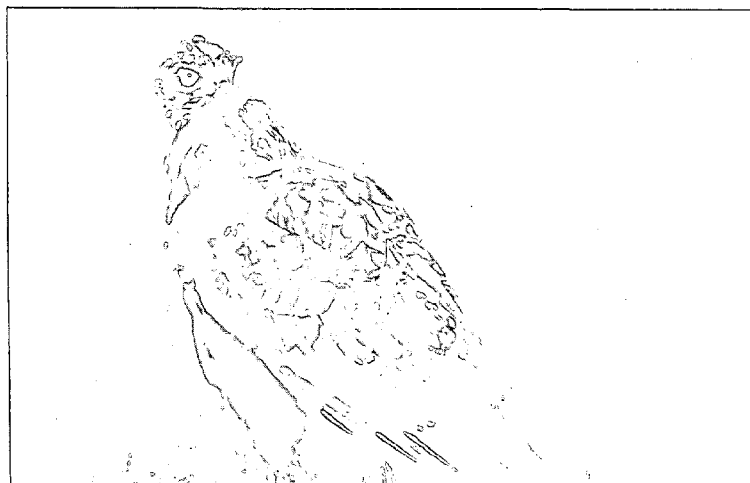
Approximately 15,000 acres in additions to this resource area is recommended to prevent loss of the critical natural and archaeological resources and protect the last large portion of unprotected shoreline (8.0 miles) in the state. Additionally, it would protect about 21 miles of riparian habitat.

Primehook

Overview	Areas of bay front beach, salt marshes, tidal freshwater wetlands, stream corridors and a forested wetland complex containing important geological and biological features provide extensive habitat for very diverse plant and animal communities. Area is important for public hunting and fishing, and prehistoric resources.
Attributes	<p>6.9 miles of Delaware Bay shoreline with adjacent tidal marshes and 70 miles of stream corridors help maintain high water quality</p> <ul style="list-style-type: none">□ 7 coastal river and stream systems <p>Very significant historical and archaeological features</p> <ul style="list-style-type: none">□ Scattered but significant hunting and gathering sites of all prehistoric periods and highly significant base camps by 500 B.C. as well as the potential for 18th century English settlement sites <p>Contains 9 State-recognized natural areas</p> <p>Very diverse plant community with known locations for 35 rare plant species of State concern including 2 of Federal concern (Parker's pipewort and swamp pink)</p> <p>Very diverse animal community with known locations for 2 rare animal species of State and Federal concern</p> <ul style="list-style-type: none">□ Delmarva fox squirrel□ Bald eagle feeding area□ Migratory shorebird feedings and resting area <p>Large coastal plain pond known as a Delmarva Bay</p> <p>150 acres of mixed hardwood and pine forests</p> <p>High access to water-based recreation opportunities</p> <ul style="list-style-type: none">□ 1 boat ramp□ 1.5 miles of bay beach front at Beach Plum Island with access <p>Very significant hunting opportunities</p>
Current Acreage	Three management units comprise this resource area. The 8,817-acre Primehook National Wildlife Refuge is managed by the U.S. Fish and Wildlife Service. Adjoining this unit are 635 acres of the State Primehook Wildlife Area and Waples Pond (69.8 acres) managed by the Division of Fish and Wildlife. Beach Plum Island located south of Broadkill Beach is 129 acres managed by the Division of Parks and Recreation. Together these lands protect 2 miles of shoreline and 26.3 miles of riparian corridor.
Proposed for Protection	An addition of about 12,000 acres is recommended to protect 4.9 miles of shoreline, approximately 44 miles of riparian corridor and several millponds.

Ellendale/Redden

Overview	This area is one of the largest forested wetland complexes in the state noted for its groundwater recharge and yield potential. It contains diverse plant and animal communities lending itself to environmental education and hunting opportunities.
Attributes	<p>Freshwater wetlands and 4,700 acres of forest lands help maintain high water quality and provide very significant water recharge/yield area.</p> <ul style="list-style-type: none"><input type="checkbox"/> Area contains coastal plain hardwoods and old growth stands of loblolly pine <p>Significant historical and archaeological features</p> <ul style="list-style-type: none"><input type="checkbox"/> Widely scattered prehistoric hunting and gathering sites from 8000 B.C. to 1650 A.D. <p>Very diverse plant community with known location for 25 rare plant species of State concern including one of Federal concern (awned meadowbeauty)</p> <p>Very diverse animal community with known location for several species of State concern</p> <p>Wide array of land-based recreation opportunities</p> <p>Very significant hunting opportunities</p> <p>Environmental education and interpretative opportunities are very extensive</p>
Current Acreage	Redden and Ellendale State Forests, made up of 8 tracts containing 5,000 acres, are managed by the Department of Agriculture. Division of Fish and Wildlife manages 147 acres at the Lang Tract. 2.0 miles of riparian corridor are protected.
Proposed for Protection	An addition to this resource area of approximately 13,000 acres to the forest is recommended to protect the current holdings from development. Areas targeted for conservation include extensive freshwater wetlands of the Ellendale Swamp, and about 14 miles of riparian habitat including part of the headwaters of the Nanticoke River.



Cape Henlopen

Overview

The cape's sandy peninsula is a dynamic geologic feature. The dune landscape, ocean and bay beaches and salt marsh combine to make this a unique natural community.

Attributes

High water quality is maintained by nearly 4.8 miles of ocean shoreline, 1.6 miles of bay beach, 5 miles of canal and 8.9 miles of riparian shoreline.

Very significant historic and archaeological features

- ☐ Prehistoric archaeological sites of statewide significance representing fishing camps and small villages from 300 A.D. and early historic archaeological sites including an 18th century lighthouse and keeper's house
- ☐ Historic structures relating to the 19th century harbor facilities and World War II coastal defenses

Very significant geologic features

- ☐ The cape itself is geologically unique.
- ☐ Dunes rise 80 feet—highest coastal elevation between Cape Hatteras and Cape Cod

Contains 2 State-recognized natural areas

Diverse plant community with known location for 11 rare plant species of State concern

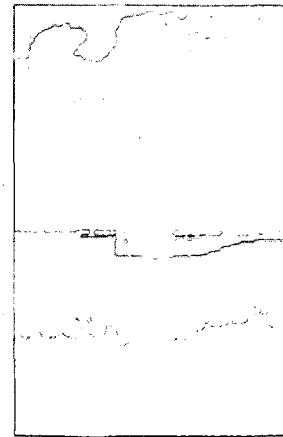
Diverse animal community with known location for several rare animal species of State concern

Very wide array of land-based recreation opportunities

Good access for water-based recreation

Significant hunting opportunities at Gordons Pond

Environmental education and interpretative opportunities are very extensive



Current Acreage

Two management units totaling 3,429 acres are contained in this resource area. Cape Henlopen State Park with 3,083 acres and Gordons Pond Wildlife Area, 346 acres, are managed by the Divisions of Parks & Recreation and Fish & Wildlife respectively.

Proposed for Protection

The protection of approximately 1,800 additional acres west of the Lewes and Rehoboth Canal is recommended to protect 9 miles of riparian corridor and 1.6 miles of canal with excellent wetlands fringed by lowland and upland wooded growth.

Inland Bays

Overview	Areas of upland forests, fresh and estuarine wetlands, barrier beaches and Delmarva Bays. Rare plants and animals along with prehistoric sites are scattered throughout this area. In this rapidly developing region there are outlets for water-based recreation, public hunting, and environmental education.
Attributes	<p>9.2 miles of ocean beach, and 34.8 miles of Inland Bays shoreline, and 15.4 miles of riparian shoreline combine to provide high water quality and significant recharge</p> <p>Very significant historical and archaeological features</p> <ul style="list-style-type: none">□ Major prehistoric encampments from 500 B.C. to 1650 A.D. was well as numerous hunting and gathering sites as early as 6500 B.C. Historic archaeological sites representing early colonial occupation in the 17th century and 18th century are present.□ Historic resources are primarily scattered 19th century farmsteads. <p>Contains 6 State recognized natural areas</p> <p>Very diverse plant community with known locations of 13 rare plant species of State concern, including 2 of Federal concern (Hirst's panic grass and awned meadowbeauty)</p> <p>Very diverse animal community with known locations of 4 rare animal species of State concern, including 3 of Federal concern (piping plover, brown pelican and Delmarva fox squirrel)</p> <p>Wide array of land-based recreation opportunities</p> <p>Good access to water-based recreation</p> <p>Very significant hunting opportunities</p> <p>Environmental education and interpretative opportunities are very extensive</p>
Current Acreage	This resource area is composed of several management units. The largest of these units is Delaware Seashore State Park with 1,656 acres. Fenwick Island State Park and Holts Landing State Park contain 208 and 84 acres respectively. Assawoman Wildlife Area protects 1,649 acres. These areas combine to protect 9.2 miles of ocean beach, 18.8 miles of Inland Bays shoreline and 2.2 miles of riparian corridor.
Proposed for Protection	<p>Several undeveloped areas remain unprotected in the Inland Bays resource area, totaling approximately 4,000 acres are recommended for protection. These sites include 16.0 miles of Inland Bays shoreline and about 13 miles of riparian corridor.</p> <p>Thompson Island with 165 acres and the Timmons property with 117 acres were recommended for purchase in the 1988 land acquisition proposal.</p>

Great Cypress Swamp

Overview

Largest contiguous forested wetland complex in Delaware. Unique hydrologic and geologic setting promotes a diverse biological community.

Attributes

- ☐ Remnants of extensive bald cypress swamp

Contains 1 State-recognized natural area

Very diverse plant community with known locations for several rare plant species of State concern

Very diverse animal community with known locations for several rare animal species of State and Federal concern

- ☐ Bald eagle nesting area

Significant hunting opportunities

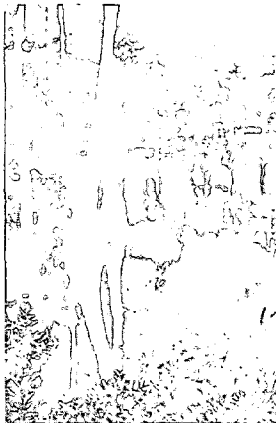
Environmental education and interpretative opportunities are extensive

Current Acreage

This resource unit is owned by Delaware Wild Lands, a private conservation organization. This is the only resource area that is solely private.

Proposed for Protection

The addition of about 2,500 acres is recommended to protect inholdings, buffer areas, wetlands and riparian habitat.



James Branch

Overview	The complex of ponds and bottomland forested corridors contains significant archaeological sites, many rare plants and the northernmost natural stand of bald cypress in North America. Significant water-based recreational and environmental education opportunities are available.
Attributes	<p>19.1 miles of wooded stream corridors, 5 ponds and adjacent freshwater wetlands maintain high water quality and provide significant water recharge.</p> <p>Very significant historical and archaeological features</p> <ul style="list-style-type: none">□ Small prehistoric living sites and scattered hunting and gathering sites beginning by 6500 B.C. <p>Contains 1 State-recognized natural area</p> <ul style="list-style-type: none">□ Dedicated, James Branch Nature Preserve—525 acres <p>Diverse plant community with known locations for 16 rare plant species of State concern</p> <p>Diverse animal community with known location for several rare animal species of State concern</p> <p>Wide array of land-based recreation opportunities</p> <p>Good access for water-based recreation</p> <ul style="list-style-type: none">□ 5 boat ramps <p>Environmental education and interpretative opportunities are very extensive</p>
Current Acreage	This resource area includes several different management units. Trap Pond State Park with 965 acres includes Trussum Pond. The Division of Fish & Wildlife manages 122 acres at Raccoon and Records Ponds. 11.1 miles of riparian corridor are protected in this resource area.
Proposed for Protection	The addition of approximately 1,000 acres is recommended to protect 8.0 miles of riparian habitat, freshwater wetlands and millponds. Wooded buffers will protect historic and archaeological features.

Nanticoke River

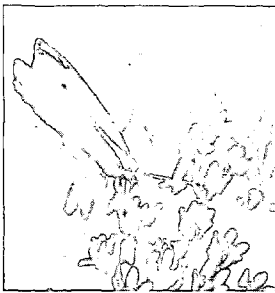
Overview	Dry upland forest, old fields and a tidal river corridor containing valuable freshwater wetlands. Area features many rare plants and archaeological sites. Significant sites for public hunting and water-based recreation.
Attributes	<p>26.5 miles of freshwater river and stream corridors with adjacent freshwater wetlands maintain high water quality and provide significant water recharge</p> <ul style="list-style-type: none">□ Anadromous fish spawning grounds <p>Very significant historical and archaeological features</p> <ul style="list-style-type: none">□ Small prehistoric living sites and scattered hunting and gathering sites beginning by 6500 B.C. and increasing in number after 3000 B.C. Also, 18th century English sites likely.□ Area near the Bethel Historic Districts□ Prehistoric sites at Barnes Woods Nature Preserve <p>Significant geologic features</p> <p>Contains 3 state recognized natural areas</p> <ul style="list-style-type: none">□ Dedicated, Barnes Wood Nature Preserve—26 acres <p>Diverse plant community with known locations of 29 rare plant species of State concern including 2 of Federal concern (box huckleberry and Parker's pipewort)</p> <ul style="list-style-type: none">□ Largest wild rice beds in Delaware <p>Diverse animal community with known locations of several animal species of State and Federal concern</p> <ul style="list-style-type: none">□ Bald eagle feeding area <p>1,500 acres of unique dry upland forest</p> <p>Good access to water-based recreation</p> <p>Wide array of land-based recreation opportunities</p> <p>Very significant hunting opportunities</p> <p>Environmental education and interpretative opportunities are extensive</p>
Current Acreage	This resource area contains two management units. The Division of Fish & Wildlife manages 1,968 acres in the Nanticoke Wildlife Area. The Division of Parks & Recreation manages 26 acres in the Barnes Woods Nature Preserve. Currently 6.9 miles of riparian corridor are protected.
Proposed for Protection	An addition of approximately 4,000 acres is recommended to protect about 20 miles of riparian corridor and is important for protecting tributaries flowing into the Chesapeake Bay. Resource area joins Maryland boundary.

Recommendation

Summary

It is recommended that the resource areas outlined be given priority consideration in acquisition or other protection efforts undertaken by the state of Delaware, local governments or non-profit agencies.

Lands within the resource areas, as well all other suggested for ultimate acquisition by the state, should be subject to evaluation based on the State Land Acquisition Rating System outlined in Section 4 of this report. The State Land Acquisition Rating System has been designed to rank properties that have been recommended for protection in a given state fiscal year according to their land quality attributes.



Stand-Alone Areas

The nineteen resource areas described above constitute the most important expansive land areas in need of protection by state agencies in Delaware. Protecting these sites will take us a long way toward achieving our greenspace preservation goals.

However, it is unreasonable to expect that all of Delaware's critical resources will be found in the nineteen locations. Through various programs and projects, the state has made commitments to protecting critical natural and cultural resources which stand alone from these large areas. These stand-alone areas will continue to be a high priority for funding and protection wherever they are found:

Natural Areas

Ecological, archaeological and geological sites which are officially listed on Delaware's Natural Areas Inventory.

Rare and Endangered Species

Habitat for endangered, threatened and rare plants and animals in accordance with their federal and state status.

Cultural Resources

High priority historic and prehistoric sites which are listed on the National Register of Historic Places.

Mill Ponds

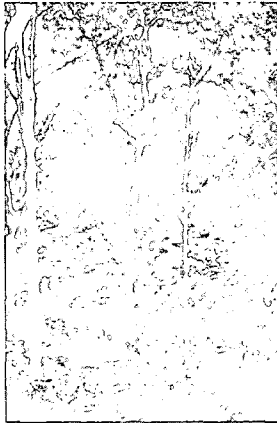
Historic impoundments which can be made available for public boating and fishing.

Freshwater Wetlands

Implementation of the recommendations of the Freshwater Wetlands Roundtable.

Stream Valley Corridors

Target areas identified through additional study which provide recreational access, control erosion and sedimentation, insure water quality, and preserve scenic vistas.



Land Protection Methods

In order to provide lasting protection to lands of state significance and others which contribute to Delaware's natural and cultural heritage, it is important that the public, private, and non-profit sectors maximize coordination of their protection efforts. Successful long-term protection will require that the full array of protection tools now available be utilized to the greatest extent possible. New and innovative techniques to provide protection to our state's highly valued open spaces and natural areas must also be aggressively pursued.

A key factor in the implementation of these techniques will be the success to which cost-effective solutions can be devised that keep undeveloped lands now in private ownership in their natural state. In many cases, outright acquisition of significant lands will prove to be the best means of ensuring long-term protection. However, the availability of both public and private financial reserves, when matched against the purchase price of available properties, may constrain the use of this option.

Recommendation

In order to maximize the amounts of open lands protected for future generations, it is recommended that an aggressive land acquisition program at the state level be complemented with efforts by local government, private businesses and individuals, and private non-profit organizations to either acquire additional parcels, purchase specified rights to those parcels, or undertake other efforts to ensure long-term protection.

The following represents a list of protection techniques that serve as a starting point of discussion for land protection methods to be used as part of the Greenspace for Delaware's Future Program.

Conservation Easement

Existing measures available to protect the unique natural and cultural attributes of a given parcel of land via a Conservation Easement are outlined in *'The Landowners Options: A Guide to Voluntary Land Protection in Delaware'*, published by DNREC. In order to more fully take advantage of the opportunities presented through use of conservation easements, additional effort will be required to undertake work characterized by what are often time-consuming contacts with individual landowners.

Recommendation

It is therefore recommended that, as part of a Greenspace Program, a statewide conservation easement program be expanded in Delaware. It is recommended that such a program be a joint effort between state government and private non-profit agencies with expertise in this work.

It is suggested that the private non-profit sector can be a valuable partner in the task of landowner contacts throughout the state and, therefore, the state should seek to identify one or more organizations to carry out this function. Contacting landowners is time consuming and contacts by the private sector will speed the process. The activities of the participating organization(s) should be focused within resource protection areas identified in the section on Lands of State Significance. Landowner contact responsibility and stewardship responsibility for those areas outside of identified Resource Areas should be accomplished with funding from the private sector that has been targeted specifically for such purposes. State government should actively work with the private sector to establish an adequate funding for such purposes.

Purchase of Resource Protection Rights

When states first began purchasing lands for public use, the relatively low cost of land offered the opportunity for state and local agencies to acquire land parcels that met the recreational needs of a particular user group. Today, however, with the cost of land in some areas of the State exceeding \$50,000 an acre, additional measures must be found to secure permanent protection for important natural and cultural resource areas.

These high costs, together with a rapidly diminishing supply of undeveloped land in Delaware, dictate that state policy directing new acquisitions of public lands must give priority toward addressing, wherever possible, multi-agency and multi-resource protection needs. High land costs demand multi-sector and multi-agency participation in protection efforts, while the dwindling supply of land requires protection of as many resources as is feasible when final settlement of the parcel is made.

In many instances fee-simple acquisition of parcels that contain unique natural or cultural resources may not be economically feasible or the best option for state, county or local governments. Therefore, resource protection programs must employ different mechanisms which permit flexible approaches to protecting Delaware's lands.

One approach that should be considered in Delaware is a modified version of Purchase of Development Rights (PDR) programs which have been employed in other states for a number of years. Unlike these other PDR programs, which focus on providing the landowner with the monetary difference between the value of a particular parcel when fully developed for commercial or residential use versus the value of the same parcel remaining in agricultural use, a recommended approach for Delaware would be to permit a public or private entity to purchase the rights to manage or safeguard specific resources in an area identified to have statewide importance. This approach is consistent with efforts in other states where the mineral or water rights on a parcel are separated from the use of the land and available for separate purchase. Other examples of such an approach include long-term leases for timber and grazing which are often part of a land managers operation in the different areas of the country.

In Delaware, specific resources or activities that could be protected by a long-term lease or purchase of specified resource rights program could include; hunting, mining, development, water, recreation, timber, wildlife, and agricultural, visual or scenic vistas, drain-

Recommendation

age, and cultural or historic resources. In some instances protection of one specific resource may require complete or partial protection of other related resources.

It is recommended that, as part of a Greenspace Program, state agencies initiate one or more programs targeted toward the long-term lease or purchase of specified natural or cultural resource property rights.

As one component of this effort, it is recommended that the Department of Agriculture work toward managing and protecting unique stands of old-growth trees by long-term lease or acquisition of the timber rights to these properties.

Under this approach, the landowner could retain the hunting, trapping, water-using, grazing, and recreation rights. The timber rights could be protected for significantly less than the cost of acquiring the property in fee-simple ownership. At the same time there may be other natural features, plants or animals that are protected simply because the timber has been protected.

Another example of this approach which should be pursued will ultimately involve a cross-section of state agencies and local governments. Here, the resource management goals of various agencies as they relate to the same parcel of land may be achieved through a cooperative effort involving the purchase of specific resource rights.

These agencies could jointly protect a parcel of land by leasing or acquiring certain rights while at the same time taking other actions that would retain other important aspects of the property.

Recommendation

It is recommended that, as a means toward implementing a Greenspace Program, opportunities to achieve multi-agency resource protection goals be identified through planning mechanisms such as the Land Use Planning Act and the Development Advisory Service, through the TEAM process sponsored by the Kent County Conservation District, and through the Environment and Infrastructure Cabinet Council.

Land Use Regulations: The Overlay Zone

The overlay zone has been used by local planning agencies to protect specific environmental attributes throughout the United States. This technique is commonly used to protect floodplain and unstable hillsides. The Federal Government has mandated this type of zoning in order to be eligible for flood insurance. The overlay zone is normally established to protect a single resource through the creation of a zoning classification that overlays the base zoning district whether it is residential, commercial or industrial. The overlay district is mapped to coincide with the resource throughout the state or county.

The overlay zone provides additional environmental safeguards beyond those that would normally be applied by restricting permitted uses and requiring special construction techniques. The overlay zone works well where there is a single resource needing a common level of protection. It is simple to administer and easy for the general public to understand. The technique loses its rationale when applied to a resource that is composed of many discrete resource management units.

Actual standards which would be applied within the overlay district are a more complex undertaking to develop if tailored to the unique needs of the resource to be protected. In practice, any form of

Recommendation

zoning district, conditional uses, or performance standards may be used with the overlay zone. This method of protection requires the production of highly accurate, large scale maps which locate the resource units. Production of these maps can be a significant expense depending on the complexity of the protected resources.

It is recommended that, as part of a Greenspace Program, state agencies develop, in conjunction with appropriate local and county agencies, overlay zones to address resources such as groundwater recharge and discharge areas, unique natural areas, historic and archaeological sites, steep slopes and floodplains. Protection standards for these resources should be developed at the local level with the assistance of technical expertise from both the state and, where appropriate, federal levels of government. Consideration should be given toward maximizing protection of the resource specific to the overlay zone in the Resource Areas identified in this report.

Tax Incentives

The use of tax incentives as a means to ensure the long-term protection of lands and properties valued for natural or cultural resources is a tool long utilized in Delaware and across the nation. Donation of land, and other alternative arrangements of sale of land, to public agencies for the purpose of permanently protecting them, have, as part of their attraction to the landowner, certain tax advantages.

An examination of tax incentives established in other areas of the country for the purpose of permanently protecting lands prized for their natural or cultural resource values suggests three broad categories which may merit consideration for use here in Delaware. The first of these categories involves preferential assessments. Other categories include deferred assessments and restrictive agreements. A detailed discussion of these categories can be found in Appendix B.

Recommendation

These broad categories of tax incentives represent a starting point from which tax options could be fashioned which encourage the long-term protection of lands important to the state's natural diversity.

It is recommended that, as part of a Greenspace Program, the state Department of Finance, in conjunction with the Commission on Open Spaces and Natural Areas, examine the state tax code and formulate one or more tax options which would encourage landowners to donate their lands or retain ownership without developing.

State Trust Fund

In 1986 the Delaware Land and Water Conservation Trust Fund was enacted by the General Assembly and signed into law by Governor Castle. The focus of the Trust Fund is for land and/or water acquisition for outdoor recreation and conservation purposes. The Trust can also fund outdoor recreation facility development.

The Trust Fund is established as an investment of State money with only the Trust-generated interest used for matching grants. To date the Trust principal stands at \$3.73 million with \$3.5 million of that sum appropriated by the General Assembly and the balance from private donations. The Trust principle cannot be touched. A current program

priority is to acquire land to protect our natural resources and provide expanded opportunities for outdoor recreation.

Recommendation

Fund administration is conducted by the Department of Natural Resources & Environmental Control, Division of Parks & Recreation. In the second grant cycle state, local and municipal agencies estimated their land acquisition costs to be over \$1.76 million. However, only \$400,000 of interest is available to fund the second cycle.

It is recommended that the Delaware Land and Water Conservation Trust Fund grow to meet the need identified in this report. Increasing the Trust Fund principal will generate more interest that can be used to preserve lands of state significance and provide land for outdoor recreation opportunities.

Local Land Trusts

Acquisition of open space by the state and local governments is, by the nature of the subject, influenced by local concerns and private interest groups with resource concerns. Sometimes, this results in less-than-objective decisions and expenditure of state or local funds for projects with only a local benefit. Conversely, many of the most significant acquisitions in Delaware's history have been initiated and strongly supported by these same interest groups.

A dilemma appears when small parcels of land are donated or offered for sale to state agencies when they should more appropriately be acquired and managed at the local level. Unfortunately, there are almost no community-based conservation organizations or local governments with expertise and interest in this area. Existing organizations, such as the Delaware Nature Society or Delaware Wildlands, cannot at this time effectively deal with local-level preservation and open space matters statewide. Furthermore, the missions and priorities of these organizations may not match the passive or active use possibilities of land made available to them.

In other areas of the country, local land trusts evolve from what are often very localized efforts to preserve a specific piece of property in its natural state. Participants in such efforts often see the solution toward protecting such properties to be the formation of a non-profit land trust organization which can take ownership of the land in question and provide ongoing management. This option can often satisfy the needs of the seller whose only previous option was sale of the land to parties interested in changing its current usage.

This type of grass-roots effort has taken shape in the past in Delaware but has not resulted in the formation of a series of local and regional organizations which can complement the work of County and State agencies involved in resource preservation.

Recommendation

It is recommended that, as part of a Greenspace Program, the State Division of Parks and Recreation give priority to convening a series of meetings designed to gauge interest in and encourage formation of local land trusts in Delaware. The long-term goal of such an effort should be to establish a network of land trusts in the State and to identify a body either within the public or private non-profit sector which would have lead responsibility for coordinating the actions and goals of a local land trust "network".

Estate Planning

Landowners are often faced with a situation where, when they have concluded that they wish to sell their properties, they find they have few options over how the character of the land will be retained by interested buyers. For some property owners, restrictive covenants or deed restrictions to preserve desired features of their properties may not be feasible for economic reasons. In other cases, the property owner may simply be unaware of options that will allow for development of their property in manner that will best preserve important natural or historic attributes associated with it.

A related situation exists where individuals or organizations interested in developing a parcel of undeveloped land for commercial, residential or industrial use are not aware of, or have no incentive to accommodate, alternative design plans that will maximize protection of natural resources on the site. In such cases, opportunities may be lost that could enhance the aesthetics of buildings constructed on the property or enhance the value of residential units based on the property's natural amenities.

These situations suggest that more work should be done with landowners and the development community to explore ways in which quality development can occur in a manner that maximizes protection to desirable natural amenities.

Recommendation

It is recommended that these options be explored by a coalition of public and private sector interests and that recommended actions, wherever feasible, be incorporated into a Greenspace Program.

Acquisition Criteria

In May of 1988, Governor Michael N. Castle unveiled an ambitious plan to acquire eight parcels of land throughout the state representing, from a natural resources management perspective, some of the most highly prized undeveloped areas within Delaware. These lands, which comprise over 1,400 acres, have diverse natural attributes and offer, when acquired, numerous recreational opportunities to residents and non-residents for future years. The Governor's proposal received strong support from the Delaware General Assembly and will receive \$21 million in funding over a three year period.

While the magnitude of this proposal and the properties identified for acquisition are now widely known within the state, a lessor known but perhaps equally important facet of the Governor's proposal was the methodology employed to determine which land parcels would be recommended for purchase. This methodology, which represented an expansion of land parcel evaluation techniques employed by the State Division of Parks and Recreation and other State agencies, marked an important turning point in how the State of Delaware will acquire and permanently protect lands having resources of statewide significance in the future.

Over the last year, the Greenspace Committee has worked to expand and fine-tune the selection criteria first used in 1988. The purpose of this effort has been to develop widely recognized and highly credible methodology by which, at regular intervals, properties that come available for potential acquisition by the State can be ranked according to the significance of their attributes. The intent of such a process is to maximize available public monies for acquisition by identifying, based on the best available professional and technical judgment, those lands which have the most to offer in terms of their natural and cultural resource value. Through such a system, it is envisioned that public monies for acquisition, in combination with the other land protection methods outlined previously, will allow Delaware to make steady progress toward permanently protecting a significant portion of the best examples of Delaware's unique historical and natural diversity.

Table 1, a Rating Chart, outlines the selection criteria that will be employed by the State of Delaware to guide future acquisitions of lands valued for their natural and cultural resource attributes. The first column in this chart describes those natural and cultural attributes and management prerogatives that will be evaluated for every parcel of land under consideration for purchase. Each property will receive a total score that will place it in numerical order with other properties. The parcels with the highest scores will be targeted for acquisition.

Chart 1-A—Rating Land Aquisition Criteria

Area Attributes	Unique 8	Outstanding 6	Significant 4	Average 2	Insignificant or N/A 0	Undesirable -2
Plants		Federal concern species	State concern species >5	State concern species <5		
Animals		Federal concern species	State concern species >5	State concern species <5		
Wetlands Values Tidal	6+ Functions	5	4	3		
Wetlands Values Nontidal	7+	6	5	4		
Riparian Habitat	High		Medium		Low	
Water Quality	High		Medium		Low	
Water Recharge	High		Medium		Low	
Geologic	High		Medium		Low	
Cultural/Historic	Listed or elig. to National Register	Potential National Hist. Reg. Listing	Potential significance but field work needed	Hist. or arch. interesting county/local		
Forests (avg. two levels)	Uncut w/in life of domin. trees High potential for regeneration		Harvest with plan Med. potential for regeneration		Harvest without plan Low potential for regeneration	
Long-term agricultural prod. (measured by LESA score)	300 to 225		174 to 224		125 to 174	<125
Scenic/Landscape Character	High		Medium		Low	
Unique Natural Feature	Yes					
Research, Scientific and Educational value	5	4	3	2		
Unusual conservation interest	Hemisphere	North America	National	Regional		

Chart 1-B—Rating Land Acquisition Criteria

Location	Unique 8	Outstanding 6	Significant 4	Average 2	Insignificant or N/A 0	Undesirable -2
Inholding to Resource Management Area	Absol. necessary to use balance of land	Desirable and completely surrounded	Desirable and surrounded on 3 sides	Desirable and surrounded on 2 sides		
Adjoins Resource Management Area	Absol. necessary to use balance of land	Necessary to other lands for expansion	Potential link to other lands other lands	Desirable to expand		
Sufficient Acreage for resource protection			Yes plus buffer	sufficient	Not sufficient	
Compatible with comprehensive land use plan			Yes		No	
Necessary access				Yes	No	
Undesirable Restrictions or Features					-2 for each restriction	
Size of Property (acres)	200>	199-100	99-50	<49		
Projected pressures						
Timeliness of acquisition	Present dev.	Proposed development in 12 months	Proposed development 24 months	For Sale no plans		
Recreation Potential						
Active Recreation		High	Medium	Low		
Passive Recreation		High	Med.	Low		
Water-based Recreation		High	Medium	Low		
Subtotal Page 1						
Subtotal Page 2						
TOTAL SCORE						

Chart 1-C—Rating Land Acquisition Criteria

Considerations	Unique 8	Outstanding 6	Significant 4	Average 2	Insignificant or N/A 0	Undesirable -2
Reasonable price	Donation	Bargain	Under Market	Reasonable		Excessive
Revenue generation						
Private Contribution	100%	75%	50%	25%		
Federal Contribution	100%	75%	50%	25%		

Implementation Procedures

Until 1988, when Governor Castle announced a three-year, multi-million dollar plan to acquire eight key parcels statewide, the State's land protection efforts were not well coordinated. Each agency which purchased and managed natural and cultural resources had its own priorities, budget requests and, sometimes, dedicated funding sources. State agencies competed among themselves for limited state and federal funds with no guarantee that the most critical parcels were being protected. This document outlines a process for a change in past practices and suggests a strategy to implement a comprehensive, coordinated and cooperative approach to land protection.

Recommendation

It is recommended that, in order to implement the greenspace program outlined in this report (and make permanent the greenspace contained within the nineteen resource areas) the DNREC take the lead in forging a public-private partnership and an agenda for action. DNREC should work closely with groups such as the Commission on Open Space and Natural Areas, and consider developing a broad-based standing "Working Technical Committee" to assist in these efforts.

It is further recommended that the Working Technical Committee be given responsibility for administering the Acquisition Criteria and rating system outlined in this document.

It is suggested that, when any parcel of land is proposed for acquisition by the state, the most appropriate agency gather information necessary for rating the property against the ranking criteria. This information will be submitted as available to DNREC. The committee would meet to review, revise and update all proposals which have been submitted. A numerical ranking list will be maintained for all parcels received for review.

The committee would recommend to the Secretary of DNREC which parcels should be pursued for protection based on the ranking and other important factors: availability of funds, urgency, restricted funding sources, opportunities for less-than-fee-simple acquisition, etc. Such decisions would continue to be subject to review by appropriate bodies such as the State Clearinghouse, the Open Space Commission, and federal agencies.

Although individual agencies may administer separate funding programs for acquisition, all projects will be reviewed by the committee before funds are committed. The committee will meet periodically to review the resource area maps and recommend revisions.

Appendices

Appendix A

Greenspace for Delaware's Future Committee

Mark Chura, Executive Assistant, DNREC, *Chair*

Charles Salkin, Division of Parks and Recreation, DNREC

Susan Laporte, Division of Parks and Recreation, DNREC

Joan Brown, Division of Parks and Recreation, DNREC

Ron Vickers, Division of Parks and Recreation, DNREC

Rusty Harvey, Executive Director, Delaware Wildlands

David Hugg, Director of Management and Operations, DNREC

Lee Emmons, Office of the Secretary, DNREC

Kevin Donnelly, Department of Agriculture

Ronal Smith, Division of Fish and Wildlife, DNREC

Gloria Homer, Delaware Development Office

Daniel Griffith, Acting Director, Division of Cultural and Historic Affairs

Kenneth Woodruff, Delaware Geological Survey

William Meredith, Division of Fish and Wildlife, DNREC

Environment and Infrastructure Cabinet Council

Kathryn Way, Director, Office of Planning and Coordination

Edwin Clark, Secretary, DNREC

William Chandler, Secretary, Department of Agriculture

George Hale, Secretary, Department of Administrative Services

John Casey, Director, Development Office

Kermit Justice, Secretary, Department of Transportation

Appendix B

The term "preferential assessment" is used to denote the class of law which simply provides that farmland or open space land or a historic site is to be assessed at its value and its current use, ignoring alternative uses. Generally speaking, very little else is required of the taxpayer, although the landowner may be required to periodically reapply for such a designated assessment. In some cases, the taxpayer may be required to have had the land in its current use for a period of, perhaps, three years. Often, however, this is not the case. If the land involved is farmland, income requirements of some sort may apply. For open space land or historic sites, some type of action by the local governing body may be required. Currently, ten states have preferential assessment laws in effect.

The second category of tax incentive used for land protection is the deferred tax. Under this arrangement, land is, again, assessed at its value in its current use. However, there are some penalties if the use of the land is changed. In its original form the deferred tax provided that the assessor was to maintain two value figures on each piece of property: the value in current use and the market value. Current taxes were based on the value in current use, but, if the use of the land changed, the saving in taxes over that which would have been levied under normal market-value assessment was collected for several years preceding. A more recent trend, particularly where states are modifying an existing preferential assessment law, has been to base the tax on the price when the land is sold rather than on the taxes foregone. Laws in the states of Connecticut and New Hampshire are examples of this type of approach. Twenty-two states now use deferred taxes for farmland. (Some states use more than one of these methods, depending on the situation. Hence the sum of the count of states using each of the three methods exceeds thirty-five.)

Landowners usually must apply to be covered by deferred tax laws. However, local governments ordinarily have no choice but to grant the tax deferral to any landowner who applies and whose property meets the statutory definitions. A partial exception occurs in Virginia, where county boards have the option of adopting or not adopting a tax deferral ordinance. Once they adopt it, however, it is effective for all qualified property if the owner applies. Some states charge interest on the deferred tax.

The third broad category of differential assessment laws consists of the restrictive agreements. Sometimes it is not easy to distinguish between restrictive agreements and deferred tax arrangements. A major distinguishing feature is the degree of choice allowed the local government. The restrictive agreement essentially allows for a voluntary agreement under which the landowner agrees to leave his land in certain permitted uses for a period of time and the local government agrees to tax the land on the basis of its value in those uses. In many ways this is similar to a deferred tax scheme in which the owner may apply, but it differs in that the local government also has a choice. Hence the local government is in a position to use these agreements as a conscious tool in shaping land use. That is, it can agree to permit the tax

benefits in return for restrictions on use in those areas where protection is needed and to disallow them in those areas where it wants to encourage development.

Typically, use of the land is restricted initially for ten years, and either party must give several years' notice if he intends to change land use. After notice is given, either the land reverts to standard taxation or charges of some type are imposed. If the owner changes land use without following the agreement, more serious penalties result.

The distinction between restrictive agreements and deferred taxes is not always clear. In a few states the penalty for violating the restrictive agreement is mild, and the law might be viewed almost as a deferred tax. According to the most current information available, ten states now use restrictive agreements for some or all of their farm property.

It should be also noted that, in addition to the three broad categories outlined above, there has been an emergence of a new hybrid species of incentive which does not fit the established taxonomy. This is the circuit-breaker version of property tax relief for farmers, recently enacted in Michigan. Farmers receive an income tax credit for property taxes in excess of 7 percent of their household income. To obtain this relief, however, the farmer must enter into a development rights agreement to keep his land in farming for at least ten years. Further, if the contract is not renewed when it expires, the farmer must pay the state the total amount he received under the program for the last seven years (without interest or penalty). The farmer may cancel the agreement before it expires, by obtaining the approval of the state land-use agency. But he must pay the state the total amount he received under the program for the entire period of his participation, plus interest at 6 percent. If he violates the agreement without obtaining approval, he is subject to a civil penalty up to twice the value of the land at the time the contract was made.

Appendix C

Existing Funding Sources

Stable sources of funding are essential to the successful implementation of a comprehensive land protection program. It is very important that funds be available as opportunities for purchase and preservation arise, not just at the beginning of a new fiscal year. Then, it is more practical to pursue sales agreements and options in advance of the availability of high-priority lands.

No single source of funds can be expected to meet the diverse needs for acquisition throughout the state and at all levels of government. For example, some federal funds are available only for boating access, hunting areas or estuary preservation. Similarly, state non-matching capital funds are typically not used to finance county or municipal purchases. All agencies must make a commitment to increased levels of funding from all sources until mutually-agreed-upon goals are achieved.

Listed below are the various sources of funds which now hold the most promise for the future of recreation and conservation land acquisition and development:

Land and Water Conservation Fund, U.S. Department of the Interior—National Park Service

This fund was established by Congress in 1964 to provide matching grants to the States (and subgrants to counties and municipalities) for the planning, acquisition and development of public outdoor areas. Since 1965, nearly \$27 million has been apportioned to Delaware for eighty acquisition, seventy-eight development and three planning projects. All federal funds were matched at least 50% with state and local funds and in-kind contributions. Over 16,000 acres of parks, wildlife areas and natural areas have been acquired through this program.

Annual apportionments to Delaware peaked at \$3.2 million in 1979 and reached an all-time low of \$155,000 in 1988. Current legislative proposals have been submitted to fund LWCF through a billion-dollar American Heritage Trust. This would result in over \$2 million per year for Delaware's outdoor recreation projects.

Delaware Land and Water Conservation Trust Fund—Division of Parks and Recreation

This permanent trust was established in 1985 to supplement and/or replace the federal LWCF. Through legislative appropriations and private contributions, the Fund principal now totals \$3.73 million. Interest only is available for state projects and 50%-matching grants to counties and municipalities. The Division of Parks and Recreation administers the grant program. No long-range targets have been set for the fund principal nor has any commitment been made to increasing the Trust. (Note: Appropriations for the special three-year, \$21 million program to acquire eight critical properties have been deposited in the Trust Fund. For these acquisitions, the principal

may be spent but the interest still accumulates for other grant projects.)

Pittman-Robertson Program, U.S. Department of the Interior—Fish & Wildlife Service

The Pittman-Robertson Program is a manufacturer's excise tax on sporting arms and ammunition. It has been in existence for 51 years and has resulted in a direct investment of about two billion dollars in wildlife restoration in America. The funds are collected by the U.S. Fish and Wildlife Service and then distributed to the states on a formula basis (about \$450,000 to Delaware in recent years). In order for states to receive these funds, they must dedicate hunting license receipts to match the federal funds on a 1 to 3 basis. The money can be used for approved projects that include wildlife research, habitat management or land acquisition. However, in Delaware this program provides the primary source of funding for the Wildlife Section; in a typical year federal support is not sufficient to fund Section operations and land acquisition.

Dingell-Johnson Act, U.S. Department of the Interior—Fish & Wildlife Service

Formally known as the Federal Aid in Sport Fish Restoration Act, this program is designed to increase sport fishing and boating opportunities through the investment of anglers' and boaters' taxes in state sport fishery acquisition and development projects. Though intended primarily for construction and habitat improvements, the funds may be utilized for purchase of public access for stream or lake fishing. Delaware received \$1.4 million in FY 88; in a typical year, as much as \$500,000 could be available for land acquisition.

Endangered Species Act—Section 6, U.S. Department of the Interior—Fish & Wildlife Service

Funds from this program totalling about \$25,000 per year are utilized by the DNREC to conserve federally-listed and candidate species within the state. The Office of Nature Preserves (Parks & Recreation) utilizes Section 6 funds for survey and inventory and protection plans for rare plant conservation. The Non-Game Wildlife Program (Fish and Wildlife) does the same for endangered animal species. Land acquisition is an eligible cost; if Congressional appropriations to this program were significantly increased, small or inexpensive properties could be considered for purchase.

Historic Preservation Fund, U.S. Department of the Interior—National Park Service

These monies are appropriated to the States as matching grants from the Land and Water Conservation Fund for survey and planning and/or acquisition and construction. By a Reagan-administration policy decision, the HPF cannot now be used for acquisition but may be in the future. Delaware's FY 88 apportionment was approximately \$320,000. \$180,000 was subgranted for planning and survey with the remainder used to support the Bureau of Archaeology and Historic Preservation.

Federal Surplus Property Program, General Services Administration

Through this program, State agencies may apply to receive properties and facilities being abandoned by Federal agencies. These lands are available case-by-case. To date, this program has been utilized at Lums Pond, Fort

Delaware, Cape Henlopen, Trap Pond and Assawoman. Lands are usually available at no cost.

**National Estuarine Reserve Research Systems (NERRS),
U.S. Department of Commerce—NOAA**

NERRS is a program which establishes and manages, through federal-state cooperation, a national system of reserves representing the different coastal regions and estuarine types that exist in the United States. The reserves serve as field laboratories for scientific research. Matching grants are available to the States for planning, research, land acquisition and management. Delaware will soon receive a preliminary planning grant to identify eligible estuarine resource areas and to propose priority sites for acquisition and inclusion in the national system. The availability of funds is uncertain but they could be spent only at locations approved and officially designated by NOAA.

**Emergency Wetlands Resources Act of 1986 U.S. Department of the
Interior—Fish & Wildlife Service**

This legislation, administered by the U.S. Fish and Wildlife Service, calls for the Department of the Interior to develop a strategy that could be used to identify wetlands that should receive priority consideration for Federal and State conservation efforts. Delaware submitted a list of 18 priority sites in April 1988. These will be included in the National Wetlands Priority Conservation Plan of USFWS. Congress has not yet appropriated funds under this act.

State of Delaware Capital Budget

The "Bond Bill" has been the primary source of funds appropriated by the Delaware General Assembly for open space land acquisition. Before FY 89, planning for the expenditure of these funds was not comprehensive; each natural resource agencies submitted independent requests. Decisions on specific parcels have often been directed by citizen or political pressure rather than natural-resource priorities. Appropriations have fluctuated dramatically with no specific amount targeted to land acquisition in any given year.

Advance Land Acquisition Fund

This state fund was created to provide money for land purchases or options when action must be taken before the legislature can appropriate funds. In recent years, this program has not been funded.

Other Funding Sources

In addition to these traditional sources of funds for land acquisition, other possibilities exist and should be pursued as opportunities arise. Donations or partial donations (bargain sale) from private landowners can reduce acquisition costs and possibly serve as an in-kind match for federal funds. Non-profit organizations such as Delaware Wild Lands, the Nature Conservancy and Delaware Nature Society can play a key role by acquiring specific lands consistent with their organizations' objectives.

Grants from local and national non-profit foundations have had limited use in the past and could be pursued more aggressively. Sometimes other government agencies will acquire lands within a targeted area for highways or other public works projects; these acquisitions should be coordinated with appropriate natural resource agencies to maximize public benefits.

Glossary

- Anadromous**—species reproducing in freshwater systems and the migrating to the sea to mature.
- Brackish**—transition zone between freshwater and saltwater systems, typically 0.5-10.0 parts per thousand.
- Conservation Easement**—legal agreement placing permanent restrictions on a property, usually to protect natural, scenic, historic, or open space characteristics.
- Delmarva Bay**—seasonally-flooded, isolated woodland ponds, formed by unique geological processes and typically containing rare plant and rare animal species; unique to the coastal plain portion of the Delmarva peninsula.
- Estuarine**—relating to where a tidal area meets a river current.
- Geologic**—includes geological structures, fossiles, rock types, or land forms. Locations with these features provide either teaching or research materials with significance at state to global levels.
- Historic Sites**—archaeological remains of Delaware's early colonial history.
- Land-based Recreation**—activities that take place on land that are either active or passive. Examples of active recreation are camping, field games, hunting and playground. Passive recreation, nature study, birdwatching, photography, hiking trails.
- Natural Area**—a portion of Delaware's landscape recognized by the State as containing unique or significant examples of our diverse natural heritage, i.e., unspoiled wetlands and woodlands, rare plant and animal habitats, geological and archacological sites.
- Nature Preserve**—a natural area dedicated with permanent legal restrictions placed on the site to protect its natural heritage values.
- Old Fields**—successional stage between open grassland or cleared land and a woodland; usually contains a mix of grasses, shrubs and young trees.
- Old Growth Forest**—area of mature tree species, usually over 150 years old.
- Prehistoric Sites**—archaeological remains of Delaware's early Native American inhabitants.
- Rare and Endangered**—a plant or animal species found in fewer than 20 locations statewide; if it is of Federal concern then it is rare throughout all or most of its range nationwide.
- Research/scientific/educational Value**—biologic or geologic aspects of a site that contribute to or have potential to contribute to knowledge of the appropriate field. The following functions are used to score this attribute in the Rating Chart: 1) baseline data potential, 2) management activities already on site, 3) history of research, 4) history of educational use, and 5) history of man's use.

Riparian—along the bank of a natural watercourse such as a stream, river, pond or marsh.

Steep Slopes—area with 15% or greater grade.

Unusual Conservation Interest—concern for features or natural resources within a site that extend beyond Delaware's geographic boundaries.

Unique Natural Community—an area with natural features of a limited size or unusualness in Delaware; i.e., Delmarva bays, old growth forests, steep slopes, bald cypress areas, dune communities and Atlantic White Cedar.

Water Quality—the overall quality of ground or surface water with respect to portability or to other State or Federal standards. The following functions of water quality are used to score this attribute in the Rating Chart: 1) public water supply, 2) industrial water supply, 3) agricultural water supply, 4) swimming, 5) secondary water contact recreation, 6) fish & aquatic life propagation, 7) cold water put & take, 8) ERES waters, and 9) harvestable shellfish waters.

Water Recharge—areas where rain fall or surface water is able to percolate through the unsaturated zone and reach the ground water table, providing recharge to either the shallow water table system or ultimately to deeper artisan aquifers. Such areas are marked by a suitable combination of water levels, permeabilities and porosities.

Water-based Recreation—activities that take place on, in or at water, e.i., swimming, boating, canoeing, fishing, clamming.

Wetlands—areas with hydric soils that are saturated by surface or ground water long enough to deprive the soil of oxygen and that support a predominance of wetland plants. The following functions are used to score these attributes in the Rating Chart: 1) recharge, 2) discharge, 3) flood storage, 4) shore anchoring, 5) sediment trapping, 6) nutrient retention, 7) food chain support, 8) fisheries habitat, and 9) wildlife habitat.

